The French Conception of Information science. "Une exception française"?

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The French conception of Information Science: *une exception française?*

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Abstract
The French conception of Information science is often compared to the Anglophone one which is perceived as different and rooted mainly in Shannon's mathematical theory of communication. While there is such thing as a French conception of information science, this conception is not totally divorced from the Anglophone one. Unbeknown to researchers from the two geographical and cultural regions, they share similar conceptions of the field and invoke similar theoretical foundations, in particular the socio-constructivist theory. There is also a convergence of viewpoint on the dual nature of information science, i.e., the fact that it is torn between two competing paradigms – objectivist or systems driven and subjectivist or human oriented. Technology is another area where a convergence of viewpoint is noticeable: scholars from both geographic and cultural zones display the same suspicion towards the role of technology and of computer science. It is therefore misleading to continue to uphold the view that the Anglosaxon information science is essentially objectivist and *technicist* while the French conception is essentially social or cultural and rooted in the humanities. This paper highlights the converging analyses from both cultural and geographical regions in order to foster a better understanding of the challenges that information science is facing worldwide and help trace a path to how the global information science community can try to meet them.

Aims and scope

The objective of this review article is to analyze the French conception of information science and compare it with the Anglophone one. While it is not an exhaustive account of views held by French and Anglophone scholars on information science, it focuses on areas of convergence. Indeed, there is a widespread belief held by the academic community in France that the Anglophone conception of information science is very different from theirs, that it is rooted mainly in Shannon's mathematical theory of communication (Fondin, 2005). I have sought to point out that while there is such thing as a French conception of information science, this conception is not totally divorced from the Anglophone one. Unbeknown to researchers from the two geographical and cultural regions, they share the same concerns on the lack of a coherent body of theories underlying research in the field, on the absence of identity and lack of visibility of the field, on how the discipline should position itself with regards to other neighboring disciplines like communication, semiotics, sociology, linguistics, computer science.
The rejection of the domination of the physical or object paradigm is one such area of convergence. The emphasis on the social aspects of sense making and on the systemic-constructivist approach to information-communication problems are two other points of agreement. There is also convergence of viewpoint on the dual nature of information science, i.e., the fact that it is torn between two competing paradigms – objectivist-systems driven and subjectivist-human oriented (Saracevic 1999, Buckland 1999, Bates 2005, Cronin 2008, Robertson 2008, Fondin 2001). This can be seen in the fact the name of the field oscillates between the singular form – *La science de l'information* and the plural form – *Les sciences de l'information.* In English, the field is also either referred to as "information studies" or "information science. Technology is another area where a convergence of viewpoint is noticeable: scholars from both geographic and cultural zones display the same suspicion towards the role of technology and of computer science (Jeanneret & Ollivier 2004, Davallon 2004, Hjørland et Albrechtsen 1995, Hjørland 1998). It would therefore be misleading to think that the Anglosaxon information science is essentially objectivist and *technicist* while the French conception is essentially social or cultural and rooted in the humanities. Such a picture of two information sciences in which one, bound to Shannon's information theory and to computer science is solely of Anglosaxon conception and another one - rooted in the humanities is solely of francophone conception, results from reducing the whole of information science research in the Anglophone world to information retrieval (IR) which is mainly grounded in this objectivist paradigm.

After recalling the origins of the discipline in France (§1), I will describe how the cohabitation of information science with communication science affects the way the information science branch has evolved in France (§2) and how it is perceived (§3). I will then look at the epistemological question raised by the use of plural to refer to the name of the field (§4). In section (§5), I will examine the rapport information and communication science in France has with technology and computer science before offering some perspectives for the future (§6). While France provides the background for this study, comparison with the Anglophone scholars will be made wherever applicable. The objective being that pointing out the converging views may create a framework for a better understanding of the challenges that information science is facing worldwide and help trace a path to how the global information science community can try to meet them. Most of the issues discussed in this paper formed part of the author's professorial thesis (Habilitation à Diriger des Recherches[i]) written in French (Ibekwe-SanJuan 2010). A much longer version of this inquiry, dedicated to the place of Information Science in France is under preparation in the form of a book to appear in (Ibekwe-SanJuan, 2012b).

Origins of modern day Information Science in France

It was the foundational works of historic figures such as Paut Otlet and Henri Lafontaine in the late 19th century, Suzanne Briet in the first half of the 20th century that laid the foundations for what will later become information science in the 1980s. In the first half of the 20th century, french library and documentation associations had close ties with Otlet's International Institute of Bibliography. Although these historical figures laid the foundations for information science, other types of research carried out by 20th century pioneers were needed in order to make the link with modern times, i.e. with the exponential growth in production of printed documents in the 1960s upwards, the start of mechanization and automation of documentary processes.

In its road to academic recognition, information science in France has traversed four periods each with its own body of works but with little or no connection to each other:

- Period 1: 1895-1950 corresponding to Paul Otlet and Suzanne Briet's foundational works on bibliography, classification systems, documentation and documents;
- Period 2: 1950 – 1974 corresponding to Jean-Claude Gardin, Eric le Grolier and Robert Pages works which saw a shift in focus from bibliographic level analysis to content analysis and the automation of documentary processes;
- Period 3: 1975-2000 corresponding to the official recognition of the ICS interdiscipline and the first two decades of existence of information science in which contact was lost with the pioneering works in bibliography and knowledge organization and the focus shifted to Artificial Intelligence (AI) and information processing to the detriment of theoretical research.
- Period 4: 2000- till present day. Under pressure from communication science scholars coupled with the retirement of the first generation of information science professors who mostly came from the sciences, IS in France is witnessing a repudiation of the physical system-oriented paradigm, of IR and technologically-oriented research in general. The current mindset is a powerful swing back to the social sciences from whence ICS originated.

Pioneering work on knowledge organization and information retrieval in the post WWII era

Salaün (1993), Palermiti & Polity (2002) gave interesting accounts of the pioneering work which prepared the ground for the transition from bibliography to documentation and then to information science in the post-WWII period, i.e., from Briet's time at the French National Library (1924-1954) till the mid-1990s. We summarize the focal points of these studies.

The development of new information practices in the late 1950s which will coalesce into what we now know as information science on the one hand and as computer science on the other, led a group of researchers to shift the focus of study from the form or container (documents, books) to the contents of documents (indexing and retrieval). The study of the former was left to library management (*bibliothéconomie*) and to librarians. In this early period, research on information related topics was carried out mainly by scholars from other fields. Robert Pagès (1919-2007) and Jean-Claude Gardin (1925-) were from the social sciences[ii]. Gérard Cordonnier (1907-1977) was a brilliant mathematician who came to be interested in problems of documentary information classification and retrieval. These researchers were faced with knowledge organization problems in their own disciplines. Eric de Grolier was one of the rare pioneers to come from documentation. All these researchers were born in the first quarter of the 20th century. Much of their research was supported by national institutions like the CNRS[iii], the UFOD[iv], the EHESS[v] and by international bodies like the UNESCO.

Eric de Grolier was a pioneer in documentation and knowledge organization. Himself and his wife Georgette de Grolier were advocates for public libraries and the promotion of reading. They were instrumental in fostering a closer relationship between library and documentation associations before and after WWII. Eric de Grolier was also instrumental in setting up the first training courses for documentalists at the UFOD in 1939. He laid the foundations of a subject heading system which later evolved into the well known RAMEAU (*Répertoire d'Autorité-Matière Encyclopédique et Alphabétique Unifié*) system. He sought ways to make specialized classification languages more compatible through normalization of classification schemes. In today's language, we would call this a study on interoperability. Despite Suzanne Briet and the De Groliers's efforts to foster a close relationship between librarians and documentalists, a breach between the two professional bodies was to occur in the post-WWII era which prevented any fruitful collaboration. However, both associations had enjoyed a fruitful collaboration in the period between 1895 – 1944 (Fayet-Scribe 1997). Consequently, documentalists and researchers working on information related problems tended to disregard classification schemes in favor of research on thesauri whose influence was attributed to North-America. This in turn resulted in a lack of research on classification schemes in France from the 1960s upwards. Ranganathan's facet classification was hardly implemented in France. While the arrival of computation and computers were seen elsewhere as giving a new lease to classification research - in Britain for instance, the Classification Research Group (CRG) flourished - this was not perceived as an opportunity in France. Classification schemes were traditionally used for organizing books on library shelves. French documentalists and researchers did not perceive at the time that they could become a means for searching documents online.

Robert Pagès was a social psychologist with a major in philosophy. He became interested in documentation when he entered the CNRS in 1951. He had observed the problems with the knowledge organization systems of his times (rigidity of universal schemes, incompleteness and inadequacy with regard to specific fields like social psychology). Critical of the Aristotelician logic underlying universal classification languages (Otlet's UDC and Dewey's DCC) whereby objects are only seen from one dimension, Pagès (1955) advocated an *n*-ary dimensional analysis of contents (documents). He suggested that "documentation" should be a larger specialty subsuming library management because the latter was about books whereas the former was about documents which subsumed books. Pagès wanted to study the relation between documents, books and experiences and pleaded for the introduction of psychology in the study of documents. His idea was that documents are made of signs and symbols which are subject to interpretation. These symbols acquire meaning outside of their context of production. Thus a document is an instrument for accumulating symbolic activity. He studied other types of symbols like mathematical language and advocated the grounding of documentary classification languages on formal scientific basis. This led him to create an analytic representation code for documents called "coded analysis" (*analyse codée*) or CODOC which went into operation in 1954 in his Center for documentation at the Sorbonne. Pagès's CODOC system was also used on Gérard Coordonnier's SELECTO cards. The CODOC system was inspired by the functioning of natural language, logics and algebra. The idea was to design an extensible grammar and a lexicon that will enable the creation of new and unexpected classes, thus giving an infinite possibility for subdivision while being easy to memorize (mnemotechnical faculty). However, the result was an artificial language for indexing and classification that was not particularly hospitable to memorization. Pagès worked on the normalization of specialized classification languages. Clearly, for Pagès, the focus was on analyzing and retrieving content, not organizing books. His idea of the nature of a document was not far removed from Briet's own wide conception. Also, his idea of a multi-dimensional approach to document content analysis was visionary given the rudimentary information indexing and retrieval systems available in his time.

Jean-Claude Gardin is a versatile scientist who majored in political economy, history of religions, linguistics and archeology. He became interested in information theoretic problems after he was recruited as researcher at the CNRS in 1950. He was confronted with the problem of sorting and comparing archeological objects referred to in scientific texts. He observed the very little work that existed on retrospective research and the absence of a system of *répertoire* (repository) of previous works done in a field. Judging important such compilation of work in scientific research, he sought ways to reduce their labor-intensive nature and to systematize the conceptual analysis of contents of scientific communication. It was in this context that he designed SYNTOL (Syntagmatic Organization Language) in 1964, a sophisticated system for facet analysis, indexing and information retrieval (IR). He also did a lot of research on discourse analysis, i.e., the structure of scientific discourse with a particular focus on archeology.

The CODOC and SYNTOL systems share some similar traits: they were both designed by two CNRS researchers from the social sciences interested in

scientific information representation and retrieval problems. Both systems sought to provide formal languages for content representation. They signaled a shift from a bibliographical analysis to a content analysis. They aimed to provide a better access to contents of scientific publication by enabling a multidimensional and combinatorial approach to IR. This paved the way for research on formalisms to automate content analysis. Gardin and Pagès' work also formed the basis for the some of the research conducted in the late early 1990s on automating information systems in France by computer scientists and first generation information science scholars who hailed from the sciences. Gardin was very critical of the emerging fields of Natural Language Processing (NLP) and Artificial Intelligence (AI). He was skeptical of the claim made by scholars therein that there could be a universal semantic representation of discourse. He argued that such methods could only work on micro domains. History has since proved him right. Pagès was equally visionary in his defense of a science of documentation that he called "documentology" and that was part of symbolic communications, grounded in the humanities and populated with "researchers-cum-documentalists". This according to him, would ensure that documentation would not be reduced to a set of techniques aimed at solving practical problems or functional issues. This denomination "documentology" will be unsuccessfully taken up later by Jean Meyriat (1983), one of the founding fathers of information science in his attempts to find an adequate name for the discipline. Unfortunately, Pagès's vision did not come to fruition. The majority of works carried out in the information science field following the official recognition of the field were largely rooted in the system-driven paradigms of IR and cognitive science. Very little space was accorded to psychology and to sociology.

While the works of Paul Otlet, Henri Lafontaine, Suzanne Briet, Robert Pages, Jean-Claude Gardin, Eric de Grolier (amongst others) laid the theoretical foundations for the emergence of a French information science, the official existence of the field in the French higher education system did not happen until 1974. Information science was not recognized as a distinct discipline but as an interdiscipline merged together with communication science. The concept of interdiscipline means here that information and communication were considered as common or shared objects, at the crossroads of several disciplines, hence the importation and borrowing of models and theories from other disciplines. More details of the circumstances leading to the emergence of this interdisciplinary field are given in the next section. It is important to observe that the official birth of information science was not grounded on the foundational works by these early pioneers. Indeed, none of the pioneering figures in the post-WW II era (Jean-Claude Gardin, Robert Pagès, Eric De Grolier) was associated with the emergence of the field. However, the first batch of professors in information science were inspired by Gardin's works, especially the SYNTOL system and his discourse analysis. Unfortunately, Gardin's work, after receiving some echoes in the 1990s, fell into obscurity. Palermiti[vi] tendered three possible reasons for this:

- these authors published in a pre-paradigmatic era (i.e. at a time when the discipline did not officially exist and no explicit paradigm was established) ;
- apart from Eric de Grolier, these authors belonged to other disciplines. However, I note that this is not a unique feature of French information scientists nor is it specific to the discipline. Many other scholars elsewhere in the world who became renowned information scientists came from other disciplines;
- what would later coalesce into information science was not yet a scientific object of research but was mainly a body of professional practice (documentation). Training courses at the time were essentially of practical orientation. There was little or no space for theoretical and historical teaching in information science. Doctoral programs at the time were also mainly concerned with solving practical problems (indexing and retrieval).

As Palermiti (2000) observed, it is ironically the development of computer science and the Internet in the early 1970s that overshadowed these early works. The focus had shifted to automatic translation, to research on expert systems and to natural language understanding (Chomsky's generative grammar). The consequence for the nascent information science was that the traditional research on knowledge organization was forsaken in favor of research models coming from the computer and AI communities with a focus on information processing.

Since these pioneering authors, very little work has been done on the theoretical foundations of information science and on knowledge organization in France (Polity 1999). There appears to have been a disconnect between the different pieces of works leading up to the emergence of the field.

The birth of a discipline: the *péché originel*[vii]

Several accounts have been given of the intricate web of events that led to the creation of what is known today as Information Science in France (Escarpit 1991, Meyriat[viii] 1993, Le Coadic 1994, Boure 2002, Tétu 2002, Palermiti & Polity 2002). The birth of a new interdiscipline called "Information and Communication Sciences[ix]" (ICS) in 1974 was the work of a committee on ICS which later became the French Society for Information and Communication

Sciences (FSICS[x]). The creation of this discipline was a result of three types of pressures.

First, the need for France to develop its own information infrastructures (servers, databases, scientific and technical document processing) and thus gain independence from the United States. Ministerial policies were focused on only one type of information: scientific and technical information. Secondly, a pressure for the professionalization of training in information technology. Thirdly, the career plans of some professors who wanted a brand new discipline where they could expect better career prospects (Palermiti & Polity, 2002). The ICS was carved out of existing humanities disciplines owing to institutional lobbying by three prominent figures – Roland Barthes, Robert Escarpit and Jean Meyriat.

Roland Barthes was a renowned writer, a semiotician, a literary critic and a philosopher. Robert Escarpit majored in literature, was also a writer and journalist before coming to communication studies. He was one of the first scholars in the French literatures community to raise the question of the role of the reader and to consider the literary act (writing) as a communication act. He first used the word communication in relation with literary writing in 1958. He was also the recipient of the first Chair in comparative literature in the French higher education system (Tétu, 2002).

Jean Meyriat majored in political science before coming to documentation and then to information science. Other prominent figures who took part in this committee for ICS was Algirdas Julien Greimas, founder of the most important semiotic school in France; Oswald Ducrot who imported Austin's speech acts theory in France and was also a pioneer in pragmatics linguistics. However, most of these prominent figures (apart from Escarpit and Meyriat) did not officially leave their discipline to join the emerging ICS discipline, rather they worked on communication problems but from the perspective of their own discipline (sociology, semiotics, linguistics). Hence, the creation of the ICS field was not the result of a consensus on its objects, theories and paradigms but rather an opportunistic coming together of professors who had done some research either on communication science or on documentation but from the perspective of their own fields. This will have lasting consequences on the theoretical grounding of the field.

Given the origin of its founding fathers (Escarpit, Meyriat and Barthes), information and communication sciences can be said to be born of literary origins.

The fact that information science was not recognized as a distinct discipline but as an interdiscipline, merged with communication science and that none of its pioneering figures was associated with its emergence will have significant repercussions on the evolution of the field. Indeed, the research carried out in the early 1980s by the prominent literary professors who are considered as the founding fathers of the ICS discipline had little or nothing to do with library management, classification schemes, documentation and content analysis. With the notable exception of Jean Meyriat who came to documentation after leaving political sciences, the others were from the literatures, journalism and semiotics (Roland Barthes, Robert Escarpit). Hence, Jean Meyriat was the only link between the official ICS discipline and the pioneering works done earlier on in information science.

It is also worth mentioning at this point that the same CNRS agency that had funded Gardin and Pagès's works on designing prototype indexing and retrieval systems has steadfastly refused to create a section on information and communication science within its own structure. Given that the CNRS is the major French research institute, its recognition of the ICS discipline would have given information science its *lettres de noblesse* – an acknowledgement by the scientific community that it had indeed risen to the status of a scientific discipline. The consequence of France's major research institution not recognizing ICS as a scientific discipline is that information science was relegated to the role of pragmatic concerns (services to other research communities) which can be dealt with through dedicated computing infrastructures like national databases and design of information retrieval programs for retrieving scientific and technical information. Such is the mission of the INIST[xi], the scientific information and document delivery center of the CNRS. The INIST hosts the two multidisciplinary bibliographic databases - PASCAL and FRANCIS. With the CNRS not acknowledging the need for fundamental research in ICS, the little funding available for research coupled with the abandon of theoretical research by its scientific community, France lost the historic advantage it had up until the mid 20th century in information science. In Ibekwe-SanJuan (2012a), I recount how the successive ministerial policies in the last quarter of the 20th century helped to shape the landscape of the current information science in France.

Haven recalled the context of emergence of Information science in France, I now come to the main issue of this paper which is to analyze the French conception of information science and see if it is indeed "*une exception française*". Information science theories, concepts and paradigms cannot be discussed in the French context without reference to communication science as the two are bound together in one interdiscipline. I will therefore begin by summarizing viewpoints on the nature and scope of the information and communication science (ICS) as a whole before focusing on the information science branch.

Information and Communication Sciences: an unbalanced union

The linking of the two concepts "information" and "communication" in the same discipline was based on a general sentiment - shared at the time that the "*more concrete notion of information would make precise the vague notion of communication. This coupling also had the advantage of serving the interest of many distinct groups of specialties without adopting a clear stance on the epistemology of the field.*" (Palermiti & Polity 2002). It is hardly surprising that the first debates were about the name of the discipline. Indeed, the ICS field has been dogged by incessant debates on what constitutes its object (or purpose) of study and where its boundaries might lie. The situation is further complicated because of the imbalance in number: communication science is at least three times bigger than information science in terms of academic staff, students and courses. With the notable exception of the National Higher School of Librarians (ENSB - *Ecole Nationale Supérieure des Bibliothèques*) which was created in 1963, library and information schools have no separate existence in the French higher education system. By a series of government reforms aimed at bringing library schools closer to the university system, the ENSB was renamed the National Higher School of Library and Information Sciences in 1992 (ENSSIB - *École Nationale Supérieure des Sciences de l'Information et des Bibliothèques*). However, the overall orientation remains pragmatic and professional rather than conceptual and theoretical and the first mission of the ENSSIB remains the training of librarians (*les conservateurs*).

The quest for the "object" of a discipline.

Information and Communication Sciences in France is undergoing the same definitional process that the anglophone world is familiar with concerning the nature and scope of information science (Hjørland 1998, Shera & Cleveland 1985, Vickery 1997, Brookes 1980, Buckland & Liu 1995, Bates 1999). It has been particularly difficult for ICS to distinguish itself as a separate scientific field from other neighboring fields such as linguistics, sociology, psychology, history, philosophy, education, journalism and even computer science[xii]. Rather than recall every single proposal that has been made to distinguish ICS as a separate field, I will try to summarize what has emerged as the "consensus" from these debates.

Robert Escarpit (1991) in his pioneering book on a "General Theory of Information – Communication[xiii]" wrote that "*Information is perceived as a product of an act called communication"* while Jean Meyriat (1981b) similarly saw information as the "*cognitive content of an act of communication*". Indeed, many first generation ICS scholars perceived information as the tangible part of that act (Escarpit 1991, Meyriat 1983). In a dictionary article, Lamizet & Silem (1997; 297) defined information as "*the meaningful data received in a communication process which increments our knowledge stock*". Thus in the first years of its official existence, information seems to have enjoyed a relatively good rapport with communication scholars as it was seen as the "more concrete" part of the discipline, more capable of obtaining recognition by ministerial bodies and by the society at large. Little did the founding fathers imagine what they were letting the discipline in for. The concept of information, like "theory, concept, life" or "happiness" is one of the most elusive and hotly debated concepts of all times. Communication is probably just as elusive and omnipresent. In their account on the emergence of the discipline, Palermiti & Polity (2002) recalled that the focus in the early 1970s was on obtaining official recognition of the ICS field in the higher education system without taking a stand on the epistemology of the field.

These early definitions made by the founding fathers (Escarpit 1991, Meyriat 1981b) are being questioned today. An official definition of the discipline which seems to gather some consensus was given by the national committee of evaluation (Comité national d'évaluation, CNE) in 1993 whereby ICS is defined as being devoted to "*the study of information or communication processes, that arise from organized or finalized actions, that may rely or not on technical tools and that partake of social and cultural mediations[xiv]".*

Since the year 2000, second generation scholars have emerged who argue that ICS cannot be satisfactorily defined by the ontological question, i.e. not by "what is information and communication science?". In a special issue of the *Hermès* journal published by the CNRS, Yves Jeanneret and Bruno Ollivier (2004) gathered some of the most significant contributions on the topic[xv]. Jeanneret and Ollivier (2004) contend that scientific disciplines have two ways of coming into existence – they are either built around an "object" (ontological question) or around a "project" (constructivist epistemology). The specific way in which the object of a discipline is defined is in itself a matter for debate. For the hard sciences (life sciences, astronomy, physics), their object may be more or less clearly identified. For the social sciences and humanities, it is quite a different story as frontiers of "disciplinary objects" claimed by one or other discipline keep shifting. They had a fine way of making this point which I have taken the liberty to translate from French:

> "*Disciplines have more or less an object, meaning that this object can be more or less clearly defined but even for the well established disciplines, it is not certain that this object does*

not slip away. If demography deals with variations in populations, it can be said to have a recognizable object, just as gastro-enterology or astrophysics do (at least for the novice). The object of sociology is already more difficult to circumscribe, it can be everywhere. That of linguistics is not at all clear for the non-linguist since it is based on a category created by linguists who invented two categories – language and speech, and decided to study what the former meant to them. As for philosophy, its object is most in(de)finite.[xvi]" (Jeanneret & Ollivier, 2004: 14)

Interestingly, scholars from outside France have made similar observations. Capurro and Hjørland (2003) rightly pointed out that information science did not have the exclusivity of the study of information and that other disciplines are concerned with this (astronomers, historians, photographers, journalists, etc.). In fact, the whole of human society is involved one way or the other with processing information.

Information & communication science is defined by its "project"

This naturally leads to the second alternative viewpoint that information and communication sciences (ICS) can only be defined by its project, i.e. its purpose or agenda. Davallon in the same *Hermès* issue (2004: 31) recognized that ICS "*reuses, experiments and adapts concepts and methods built for other objects in other scientific domains*."

Just like scholars have done elsewhere (Buckland 1991 & 1999, Floridi 2002 & 2004, Bawden 2008), ICS scholars seem to agree about the futility of choosing objects, problems and methods that would belong solely to ICS, in a bid to claim disciplinary status:

"*It was also necessary to refuse at once a certain number of complexes and representations that have for long animated debates on the scientificity of information and communication sciences. Push to the background, in as much as possible, the idea that objects, problems and methods could be the properties of specific disciplines*[xvii]*"* (Jeanneret & Ollivier, 2004: 17)

Jean-Baptiste Perret (2004) in the same special issue of the *Hermès* observed that the difficulty to distinguish research objects is common to all "*constituted disciplines"*. I suppose that by "constituted", he means "non natural". He goes on to say that:

"The desire to delineate the scope of a discipline comes up against two classic impasses related to the criteria for recognition and validity of a science.

- On the socio-historical level, the circle of relativism: a discipline is what scientists in the field decide that it is. Its identity relies more on a consensus between scientists than on some conceptual agreements, and depends above all on the state of the power tussle therein.

- On the theoretical level, the circle of knowledge: any judgment on the relevance or validity of an assertion relies itself on the implicit recognition of a certain paradigm, hence on another judgment that cannot be proved. Hence, there is not and there cannot be a scientific definition of scientificity nor any "theory of a good theory.[xviii]" (Perret, 2004: 122).

Since its official recognition and up to the present day, the ICS discipline has oscillated from one definitional axis to another. Definitions that revolve mainly around one discipline tend to be self-serving, aimed at legitimating the belongingness of their authors to the field. The center of gravity at a given time - in terms of the discipline to which ICS is leaning heavily towards depends on the "*rapport de force*" (power tussle) within the ruling body – the National Council of Universities (CNU) for the ICS - rather than on any scientific proof of the superiority or adequacy of one epistemological approach over another. The current center of gravity is very much in favor of theories, paradigms and methods from the social sciences and humanities (except linguistics) and very much in disfavor of computer science and the sciences. Bates (1999) observed the same oscillations and a current swing back to the social sciences for methods and theories within the Anglophone information science community.

Systemics and constructivist epistemology as theoretical foundation for Information & Communication Science

The avowed impossibility to strictly define the objects of the field and to claim ownership of these objects give rise to a second consensus: what distinguishes ICS from other disciplines is the "*communicational look*" it bestows on objects, be they technical or not (Davallon, 2004: 30). This viewpoint is linked to the constructivist epistemology which holds that scientific objects do not exist independently of a subject (the person contemplating them). The constructivist epistemology adopted by the Palo Alto group, has been fiercely championed in France by Jean-Louis Le Moigne (1995), a prominent scholar on systemics and constructivism. The constructivist epistemology is reconcilable to the systemic theory of communication considered by many communication scholars as the most adequate theoretical foundation for ICS (Mucchielli 2000). As to how this communicational look or approach might be deployed as a methodology, Mucchielli writes:

"To adopt a communicational approach to a phenomenon is to analyze it as an element of a system contributing, in a circular movement, to the emergence of another phenomenon [xix]*"* (Mucchielli, 2000: 43)

Hence, the communicational approach introduces a circular causality whereby communication is seen to take place in a system where interactions are circular

(chain of retroactions), thus placing this conceptual approach also within the complexity paradigm. Based on this viewpoint, it then follows that it is the manner in which objects are regarded (and thus the project) that makes the uniqueness of the ICS discipline, not the objects themselves – information and communication, since these can be claimed to also be the objects of investigation of other disciplines (psychology, philosophy, semiotics, economics, journalism, politics, law, biology ...).

I see a *rapprochement* between Mucchielli's viewpoint (2000) and the one defened by Hjørland & Albrechtsen (1995), and later by Hjørland (1998). Although they did not work on the same object - Mucchielli was proposing a communication theory while Hjørland et Albrechtsen were proposing theoretical foundation for information science, both approaches advocate the anchoring of the discipline on a socio-constructivist rather than on the cognitivist theory. Both advocate non linear, holistic approaches to the study of information and communication phenomena that serve communities, organizations and groups rather than individuals.

Is methodological purity desirable or even possible?

The theoretical debate naturally spills over to the methodological level. What kinds of methods are acceptable for ICS discipline? Several papers published during the 16th annual Congress of the French Society for Information and Communication Science held in 2008 concluded that the diversity of objects of study, of epistemological traditions and theoretical approaches to information and communication show that no one methodological approach or theory can account for all the research that fall under the scope of the discipline. Indeed to try to impose a single unified theory is not only illusionary, it will be seen as a totalitarian manoeuvre (Jean-Luc Bouillon 2008). Not unlike information science in the Anglophone world, research in ICS also seem condemned to borrowing models, theories and methods from other sciences. This is evident when one analyzes the methodologies deployed in the doctoral dissertations defended in the French ICS discipline. Buisson Lopez (2008) noted for instance that "*doctoral [theses] focused on machine-mediated communication borrow theories and methodologies from engineering sciences in order to study messages, senders and receivers of such communications. Those concerned by interpersonal communication are in grounded on anthropology and social psychology whereas the dissertations focused on discourse analysis and on institutions flirt with education, history or law.*"

This is not unique to ICS nor to France. A similar observation was made by Marcia Bates (1999) regarding the methodological shifts in information science:

"*A final comment on methodology: regarding the great methodological shift sweeping through the social sciences, the shift to the qualitative, multiple-perspective, post-Modernist approaches—these new techniques simply add to and enrich the armamentarium of techniques available to the information scientist for studying the subject matter of our field. For reasons that have already been argued, this field requires multiple methodological approaches to conduct its research. In mid-20th century social science we have had a series of waves of methodological fashion—each wave declaring the prior approach to be hopelessly bankrupt and inadequate. It is to be hoped that it is finally recognized that all of these methodological approaches can be powerful and useful—especially in information science.*" Bates (1999: 1049).

The French vision of Information Science

Researchers that identify with the information science branch within the ICS discipline have naturally attempted to define the "object" of this branch (Meyriat 1981a&b, Salaün 1993, Le Coadic 1994, Fondin 2001, 2002). Polity (1999) echoed the same sentiments as Jeanneret & Ollivier (2004) concerning the object of ICS and argued that a field cannot be defined through lexical or ontological definitions but by its objectives, by the problems it proposes to study and the methods it employs to solve these problems. This viewpoint has also been successfully argued by Capurro & Hjørland (2003) and Floridi (2004) regarding the impossibility to define information using a dictionary and the impossibility to arrive at a unique definition that will serve all purposes.

On the dual nature of Information Science: a shared viewpoint

Underlying the difficulty to define information science as a scientific field are the historical difficulties and debates in defining such notoriously ambiguous concepts like "information, knowledge, truth, concept, life, love, happiness". Without re-opening this debate, I observe that a convergence exists between views held by French and Anglophone authors on the lack of operativeness of the concept itself. Fondin (2002) and Buckland (2010) have observed that one cannot usefully employ this term without specifying which meaning of information one is referring to. In the same vein, Fondin (2001) wrote:

"*[...] every word is thought of in the context of a theory or in reference to a more or less explicit model. It [the word] thus acquires specific properties. To talk of "communication", and be understood, one needs to first indicate the communication theory in which one is situated. The same thing goes for "information". A specialist cannot speak of this term without reference to an underlying theory. At the very least, s/he must always employ "information" with a qualifier or an explicative in order to be understood by other specialists*[xx]."

Furner (2004) has also argued that information is too inadequate a term for the discipline because of its inherent ambiguity. He suggested that it could be replaced by one of its surrogates, namely "relevance". However, as Buckland (2010) pointed out – information is a very fashionable concept and is not likely to disappear any time soon. Most people think positively of the concepts of "information society, information highways, information technology" all dealing with the technological aspect with which information science is often confused. Later in Furner (2010), a review of the different conceptions of information in the Anglophone literature was proposed. The author ranged them into three broad categories: *semiotic* family (those who make distinctions between "information-as-thing" (concrete objects, signs), "information-as-knowledge", e.g. Buckland 1991); *socio-cognitive* family (those who lay emphasis on "information-as-process", i.e., the process through which people become informed, e.g. Brookes 1980, Belkin 1990); *epistemic* family (those philosophically oriented, who emphasize the properties a resource must have in order for the information it emits to qualify as justified truth belief, thus the "conceptions of information-as-*evidence*". Such approaches derive fundamentally from Shannon's mathematical theory of information, augmented with philosophy of language or informational semantics, e.g. Dretske 1981).

More fundamentally, Fondin (2001 & 2002) acknowledged that information science is torn between two competing paradigms: (i) an objectivist paradigm attributed to the Anglophone world (as if this world is homogeneous in its analysis and viewpoints), and (ii) a subjectivist conception attributed to francophone viewpoint but which is not peculiar to it as I will show. In a later article published online, Fondin (2005) tried to distinguish the French conception of information science from what he perceived as the North-American one as follows:

"*Is information a real tangible object or a social object? Embodied in this interrogation is the whole question of "meaning" and its attribution. Meaning, this coherent mental representation that every human being constructs or deduces from things observed in his environment, what he calls information if the meaning is shared, is it immanent (intrinsic) because laid out in the document by its author, or constructed because contextually built by the beholder, in this case the reader? In the former case, and this is explicitly or implicitly the thesis defended by advocates of information processing, those situated in the north-american vision of information science, information is a discrete element. For them, are possible all extraction operations based on locating linguistic forms in texts. And given that they are working on the original text of the author, the results of the processing are all the more faithful to the text and to its author*."[xxi]"

From the above excerpt, it would appear that the North-American viewpoint of information is steeped in the information retrieval paradigm, thus in a positivist approach in which documents are perceived as having an innate subject, inherent in the words, just waiting for the reader to pick them up. There is no denying the fact that the physical or object paradigm has played an important role in the development of information science worldwide.

Fondin attributes the second human-centered conception of information (the constructivist conception) to the French approach. In this conception, the "immanency" of information and the validity of automated processing of information are refuted because only humans, the reader in real life situations can construct meanings. Meanings are compulsorily linked to a context, that in which it is received. In this viewpoint, information, i.e. the content of a document, cannot be a fixed, definitive or eternal thing[xxii].

Sylvie Leleu-Merviel (2010: 8) defends a similar constructivist viewpoint on meaning construction when she writes "*Patterns, and therefore information, are a construction of the interpreter or beholder"*. She also argued that it is not the data itself that supports the information but the relation between data[xxiii].

However, I think that there ought to be limits to individual construction of meaning. Taken too far, it may lead to serious ethical, historical and practical problems. For instance, how many different meanings can be construed from Hitler's *Mein Kampf*? Is it acceptable that an individual meaning construction leads to asserting that this book is about tolerance when indeed it is about the opposite? Fondin (2005) seemed aware of this pitfall when he acknowledged that although meaning is constructed by individuals, it does not authorize each person to deduce whatever s/he chooses, that there is such a thing as collective sense-making or shared interpretations based on social contexts and that words do matter. Furner (2010) reviewed different philosophical views on *aboutness* of documents. He identified at one end of the pole, the idealist view which hold that there is no way in which

the aboutness (subject) of documents can be determined. At the other end, the realist view hold that there is a "regular procedure by which a work may be analyzed in order to discover its subject", notably through "linguistic expressions that comprise subject statements" (Furner 2010).

This bi-polarisation of conceptions of information and information science is found in the texts of many French ICS scholars. Obviously, for them, only the social conception of information is acceptable. Paradoxically, this overwhelming rejection of Shannon's mathematical theory of communication in ICS became the norm after some authors had unsuccessfully tried to apply it to information and communication studies (see Salaün 1993 and Jeanneret 2007, Baltz 2007 for examples of some unsuccessful attempts).
The opposition between the "objectivist-physical" paradigm and the "subjectivist user-oriented" conceptions of information and communication is not a 'franco-french' thing. Several authors from the anglopohne world have already analyzed the influence of these two opposing paradigms in research in information science (Saracevic 1999, Buckland 1999, Bates 2005), Cronin 2008, Robertson 2008) with regard to its relationship with Information retrieval (IR).

Saracevic (1999) recalled that this historic opposition dates back to the origin of the discipline in in the Anglophone world and is attributed to two historic figures – Jesse Shera and Gerard Salton. Anglophone authors who have analyzed the consequences of this opposition – a parallel existence on the one hand of the IR community around Salton's work and a more people-oriented approach embodied by the ASIS&T - have also called for a better merging of the research agenda of both approaches (Saracevic 1999) as the only way forward for information science. Although this goal has not always been achieved, the anglophone community in information science have adopted a more pragmatic approach and reached a *modus vivendi* on how to accommodate social and people-centered approaches with a more technological one. They seem aware of the fact that information science cannot ignore technology altogether nor not concern itself with the design of information systems as a means to ensure better access to information. Bates (1999 :1049) also contended that the methodological substrate of information science is of a socio-technical nature and observed the same duality in information science by stating that the two most important research methods the field draws from are the social sciences and engineering sciences.

No information without communication?

For ICS scholars, the act of communication is intentional, i.e., triggered by humans for a given goal. In this perspective, the object (or rather the purpose) of information science is to study the "*modalities and processes of this finalized communication*" and this should be done "*within a global approach, whether based on a device (tool) or on a social system*" (Fondin 2005). In an earlier article, Fondin (2001) stated that this goal was specific to IS[xxiv] and would justify the disciplinary status of information science. Yet four years later, Fondin (2005) seemed to retract this assertion by stating that the *"the term "science" is inadequate to qualify this sector with a very technical agenda. One entertains a confusion between science and technique or engineering*[xxv]*"*. Seeking to further distinguish the French conception of information science from the anglophone one, he writes:
"*No north-american scholar can imagine having anything in common with communication scholars [in France]. The anglosaxon information science considers itself a separate science and claims this status. The only enormous problem is that some forty years after its birth, information science is still chasing after its recognition. Indeed, how can one envisage a study of information that excludes the accompanying communication phenomenon? How can one study the content of a message without considering those that create it, those that transform it and those that use it? These activities, because they are highly complex ones with high stakes, are communication activities. Hence, in this light, information science cannot not belong to Information and Communication Sciences. It is this refusal to acknowledge communication that explains why the "historical" information science [anglosaxon one] remains locked in a technical conception, with seemingly no future, on problems of the modalities of production, of dissemination and usage, while ignoring the human factors underlying these activities*.[xxvi]"

It seems to me that Fondin's analysis applies in reality to Shannon's linear theory of communication and to research carried out within the IR field which is mostly of computational inspiration but not to Library and Information Science where a lot of emphasis has been placed on user studies. The French view of IS is not a monolithic bloc upholding a humanistic approach against an object-oriented approach, attributed to Anglosaxons. There are also at least three French ICS professors who have championed Shannon's work and its contribution to the development of ICS as a field in France: Abraham Moles (1975) was a French ISC scholar who came to communication from engineering. He is the best

french specialist of Shannon's work. He translated Shannon's 1948 book into French with an introduction from Warren Weaver. He personally met Shannon and Norbert Wiener. Jacques Perriault (2004, 2007), also a professor of ICS is a strong advocate of the role of technology in ICS. Claude Baltz (2007), another interpreter of Shannon's work has deplored how badly his mathematical theory of information has been misunderstood by communication scholars.

Indeed, many North American information scientists share this communicational conception of information science with their French counterparts. Marcia Bates (1999) clearly stated that "*the field's interest is in human-produced information, and therefore, how human beings relate to this information—how they seek it, use it, ignore it, retrieve it—is of central research importance also*". She also established a counsinry with communication science when she wrote "*In communications research, a cousin to our field, the emphasis is on the communication process and its effects on people; in information science we study that process in service of information transfer."* (Bates 1999, 1048).
Much earlier, Buckland (1991) in his book "*Information and Information Systems"* defended a human oriented conception of information. He adopted a wide view of "information systems" from which mechanical and machine-based processes were precisely excluded. He started his book by observing the inappropriateness of including data processing (information technology) in information studies and argued that an "*exploration of information systems*" must "*include the social, economic and political contexts*". Information studies without this social dimension, he argued, would be incomplete (Buckland 1991: 9). He precisely advocated that information science should "*include communication both at interpersonal and mass levels.*" Not unlike Fondin (2005), he argued that information systems were "*supposed to inform people, but in practice, they deliver physical stuff such as books, papers and signals on glowing screens*" and that "*all information systems deal directly with and only with physical objects such as coded data or documents*" (Buckland 1991: 10).

Buckland (1999) also defended the viewpoint that information in itself is not important and that what is more important is its relation to knowledge and to communication. Saracevic (1999), proposed another definition of information science where the emphasis was laid on the relation between information and knowledge and on the social function of information science in mediating between people and information resources[xxvii]. As we can see, these viewpoints are remarkably close to those of the French ICS's views on how the field should be defined - by its projects and approaches rather than by the objects of investigation. It appears that these writings are not widely known in the French ICS community and that language is indeed a barrier. If this is case, then we have a serious communication problem (no pun intended).

Convergence of research agenda on both sides of the Atlantic

In terms of research orientations, there also appears to be a remarkable convergence between some North-American and French scholars. The three research questions outlined by Bates (1999, p. 1048) for information science more or less align beautifully with the three research poles around which information science should be structured in France according to Jean-Paul Metzger (2002).

- The physical question "What are the features and laws of the recorded-information universe?" in Bates (1999) can be aligned with the "formalization and computation" agenda of French information science in Metzger (2002).
- The social question "How do people relate to, seek, and use information?" in Bates (1999) would correspond to the information search behavior (user studies) pole in Metzger (2002).
- The design question "How can access to recorded information be made most rapid and effective?" in Bates (1999) can be partially aligned with two research poles in France called "information production process" (*circuits de production de l'information*) and its "modes of diffusion" (*modalités de diffusion de l'information*).

Although Metzger's three poles are not entirely acceptable to all ICS scholars in France, they nevertheless reflect the main research orientations that information science has taken since its official birth in the mid-1970s. There is also an analogy between Bates's (1999) proposal to consider information science as a meta-discipline serving other disciplines by focusing on the form rather than on the content, and the ambition of the founding fathers of ICS who wished to make it a kind of "*super-science whose research problematic would irrigate almost all the known and classified disciplines in the classification of the science."* (Miège 2005, quoted in Gerini 2008).

The recurrent debate in France about where the boundaries of information science and ICS lie strongly echoes similar debates in the Anglophone world. With their usual pragmatism, our Anglophone colleagues have decided that not only can we not provide a sound scientific argument in support of any boundary but that this debate is a waste of time:

> "*It seems a remarkable waste of time and effort to worry about setting up disciplinary*

boundaries, and debating who is in and who is out." (Bawden, 2008).

I am wholly in agreement with this statement.

What's in a plural? *La or Les sciences de l'information?*

Behind this deceptively simple question lie a series of epistemological questions about the very object of information science. The exact name of the branch within the ICS discipline is a point that is rarely debated in the French academic community. As Palermiti & Polity (2002) observed, the opportunistic coining of the field's name "Information and Communication Sciences" was done at the expense of clarification of the scope of the coordination: is it a distributive *and*, i.e., a conjunction of two separate disciplines - "information science" and "communication science"? Is it an additive *and* i.e. of one or more information sciences with one or more communication sciences or is it a combination of both? In the absence of this clarification, the door was left open to all kinds of interpretations and manipulations by different interest groups. This denominative *faux pas* can be seen as the *péché original* under which ICS and subsequently information science have been belaboring for decades. Information science scholars in France have not yet agreed on whether we have one information science or many information sciences. Indeed, the name of the discipline is often encountered in plural - "*Les sciences de l'information*" (Staii 2004, Salaün et Arsenault 2009) but also in the singular as "*La science de l'information*" (Fondin 2001, 2002, 2005). Does the plural refer to the same information science that emerged in the context of the cold war in the United States and under the same umbrella as communication science in France? What body of works differentiates one information science from another? What are the underlying paradigms of each information science? Two hypotheses can be put forward:

1. the plural form is used implicitly to convey the idea that information science is made up of several other disciplines or specialties that historically founded it, i.e. documentation, library studies, archiving, therefore it constitutes a branch of the humanities or of the social sciences;
2. for epistemological reasons, given that information science is an interdiscipline irrigated by different epistemological approaches and paradigms, the plural form subconsciously reflects the idea that each epistemological family reflected constitutes a type of information science.

An example substantiating the first hypothesis would be this excerpt taken from the presentation of the School of Information and Library Sciences in Montreal ("l'École de Bibliothécaires et des Sciences de l'Information, EBSI):

"Information sciences build on the solid roots of the traditional professions of document: library studies and archives and is deployed in more recent avenues of strategic information, knowledge management and the multiple developments brought by electronic technology.[xxviii]*"*

It is also in this sense of a discipline made up of other sister specialties that Jean Michel Salaün (1993) speak of "*Les sciences de l'information*" in an article written on the origins of the discipline within the larger ICS discipline, although he does not explicitly justify his use of the plural form. This also appears to be the justification for the use of the plural on the Wikipedia page[xxix] dedicated to the discipline where it is stated that the French equivalent of "LIS" (Library and Information Science) - *Sciences de l'information et des bibliothèques* - is "*used to designate a set of knowledge and know-how useful to people in charge of managing libraries or an information-documentation service*". The article goes further to specify that the official name of the discipline is "*Sciences de l'information et de la communication*" (Information and Communication Sciences) and that this "*field is characterized by its object (information, its nature, its properties and its transfer) rather than by its methods*". Further on, the article states that different approaches to the study of this object are possible but mentions mainly the physical-object approach involved in information transmission which it says is the chief mission of "*Les sciences de l'information*". It concludes by saying that "*Les sciences de l'information*" covers other specialties like Library management, bibliography, cataloging and indexing as well as "bibliology". This definition portrays information science as the technological branch of ICS, encompassing other sister and practical fields. It does not reflect the viewpoint of current french information science scholars who wish to distance the field from this instrumental conception.

Francophone scholars who refer to the discipline in the plural rarely go into theoretical justifications of the plural. A notable exception is the article by Fondin (2002) where he analyzed the implications of using the singular or the plural form. According to Fondin, the use of plural to designate the discipline is explained by the fact that information science is torn between two opposing and irreconcilable conceptual approaches or paradigms already described above. This is in agreement with our second hypothesis above.

Further, Fondin argued that the question of plural hardly interests anyone else except the French since

the Anglosaxons have their "*Information Science"* and *"scholars in journalism (media studies) belong naturally to communication science, while computer scientists have their Computer Science"*.
In the french context, the plural form would designate a pluridisciplinary stance, whereby scholars from different disciplinary backgrounds cohabit under different conceptions of information science without defining a common coherent object nor agenda nor taking an epistemological stance (Fondin 2002). This conception, according to him is that defended by advocates of information science as an "intentional science" in a broad sense. He wondered what specificity there might be behind this vision. He goes on to say that "*insofar as debates focus on the object of information science, i.e. information, many can claim belongingness to the field*". The common ground would be an agreement on a pluralistic approach, thus justifying the use of the plural form "*Sciences de l'information*" but at the expense of a clear identity and research agenda. This enables computer scientists who deal mainly with data, journalists, information producers (media, journalists) to also claim belongingness to information science because information is not defined precisely (but is this possible?), thus allowing anyone to claim to study this object with his own tools and aims.
The singular form "*La science de l'information*" on the other hand refers to the "interdisciplinary viewpoint, thus evoking the idea of crossing or sharing around the object of information:

"*If on the other hand, information science, like the other sciences, is defined by its object [purpose or agenda], and by what it aims to explicate or comprehend through the object of study, by its knowledge and methods, then the interdisciplinary approach is wholly justified. In this context, every scholar can use elements borrowed from other sciences but reconstructed to suit their object (project) of study. This specific object of study is yet to be defined*.[xxx]" (Fondin 2005).

What is implied in the singular form is an acceptance among all the possible conceptions of a chosen object, for instance scientific and technical information (STI). This viewpoint sees information science as an autonomous science and he assimilates it with the anglophone viewpoint defended in the late sixties by Harold Borko (1968).
However, Fondin observed that despite this quest for autonomy, Anglophone scholars have often talked about the plurality of information science. Indeed, Bates (2007) edited an "encyclopedia of the information disciplines" where she speaks of "the information sciences" in much the same way as we talk of the "social sciences" as a category of scientific disciplines. According to Bates (2007), "*The information disciplines all deal with the collection, organization, retrieval, and presentation of information in various contexts and on various subject matters. That social purpose, of collecting, organizing, and disseminating information shapes all the activities of the information disciplines*." This is inline with her earlier view of the information science as a meta- or orthogonal discipline, together with communication science, journalism, education, serving all the other more traditional disciplines. What drives information science is societal need (Bates 2007, Buckland 2010). Furner (2010) also employ the plural in talking about "the scope of information studies and/or the information sciences". Bates's and Furner's usage is in line with our first hypothesis above, i.e. that scholars across geographical and culture zones who employ the plural consider "information sciences or information studies" to be made up of a bunch of sister disciplines or specialties, thus elevating information studies/sciences to the same level as "the social sciences", the humanities, even if in their minds, information studies are also part of the social sciences and the humanities. A number of schools outside France are being called "that it raises, as Fondin rightly pointed out, is that of "inter-" or "pluri-" disciplinarity.
Fondin's analysis quite capture the *status quo* in the French literature on this question. Fondin himself only claims one "Information Science", that "*which aims to understand the specific communicational process of information search"*. I have also chosen to express the name of the discipline in the singular thus implicitly agreeing to the interdisciplinary stance of the field, which although borrowing theories and methods from other sciences, aims to build a coherent research agenda geared towards a better understanding of information phenomena and its processes, involving both humans and machines.

Lately, an informal debate has been ongoing about the formerly acclaimed "interdisciplinary" nature of ICS. Some scholars have begun to see this as more of a weakness rather than a strength because it smacks of too much borrowing from other disciplines with very little internal coherence, thus making ICS run the risk of not meeting the standards for disciplinehood. Buckland (2010) for instance also argues that interdisciplinarity could be a weakness rather than a strength for information science and that it puts the field in a weak negotiating position in times of austerity (fewer departments and funding).

The 'attraction – repulsion' of technology

Technology has always been a sensitive issue for many fields in the humanities. In France in particular, because of the peculiar circumstances of the emergence of information science, it has become an even more sensitive issue. The relationship of ICS

towards technology and technically-oriented research has been one of "attraction – repulsion". Anglophone scholars have also issued warnings about the dangers of a too technological approach to information science problematics (Saracevic 1999, Hjørland 1998, Hjørland & Albrechtsen 1995). In particular, Hjørland & Albrechtsen (1995) expressed the fear that the physical paradigm (*systems-driven paradigm*) symbolized by Shannon's information theory and by computer science, if not checked, would turn information science into an application terrain for specialists coming from other disciplines who work on information theoretic problems but from the context of their original discipline. This will make information science unecessary as a scientific discipline (Hjørland et Albrechtsen 1995, p. 410). This threat is expressed again in Hjørland (1998) regarding the way IR research has evolved.
In France, the early 1980s and 1990s had witnessed a fruitful collaboration between information science and physical systems-driven paradigm. This good rapport corresponds to the first two decades of existence of the discipline, when the quest for scientific legitimacy led scholars to seek alliance with the hard or experimental sciences. Models and methods from Natural Language Progressing (NLP), Artificial Intelligence (AI), cognitive psychology, IR, knowledge representation, bibliometrics, scientometrics were brought in to develop research in natural language understanding, automatic indexing, information retrieval, automatic translation, expert systems. With the retirement of the first generation scholars who championed such research programs and who came mostly from the sciences (Jacques Rouault, Richard Bouché, Henri Dou), such strains of research are being phased out. It has become now "*de bon ton"* (fashionable) to be very critical of any technological approach to ICS problematics and critique what is perceived as a "*technicist"* approach to the objects of the discipline (Perret 2004, Jeanneret 2004 & 2007).

What communication scholars chafe most against, is all the media hype about the wonders of technology, the revolution attributed to the internet, to web 2.0 applications and to the "semantic web" where it is often not highlighted that it is people that turn technological devices into tools for machine-mediated communication and that without people, these technologies will remain clever additions of code but nothing else (see Buckland 1991 for an extensive discussion of the limits of systems and information processing for information science). For Jeanneret (2007), the term "information technologies" is inappropriate because it maintains a confusion between two conceptions of information, one used in the mathematical sense to refer to data processing and the other to human-mediated information that is embedded within social practices. Like Buckland (1991) had done more than a decade ago, Jeanneret (2007) observed that what the computer programs disseminate are material objects (signs) and not information in the human sense of the word and that the so-called "information technologies" should, strictly speaking, be termed "*semiotic technologies or text technologies*".

Concerning the attitude towards technology and computer science, the picture, as often, is not just white or black but in shades and nuances. Some scholars from communication science (CS) have acknowledged that the conception communication science researchers themselves have of communication is fundamentally a technical one (Davallon 2004), i.e., communication is perceived as a tool, as a means to an end, thus reflecting the subconscious belief that "*there can be no communication without a tool"*. As Davallon observes, "*Society sees information and communication sciences spontaneously as a theory of technical object – i.e., as a technology. Hence, any research concerned with another dimension (conditions of production, context of reception, etc) will appear to belong to other disciplines such as economics, sociology, etc"*. In his book entitled "*Shannon revisité*" (Shannon revisited), Baltz (2007), an information science professor used role play to portray this subconscious technical conception of communication. To illustrate Shannon's linear model of communication, students were asked to pass on some information from one person to another. The result was that students would necessarily look for a means (tool or device) with which to pass on the communication. This illustrated the fact that "*communication is first and foremost a question of technique, and often, with any means available to us*[xxxi]" (Baltz 2007:19). Jeanneret & Ollivier (2004: 88) speak of the fascinating power of technology and warned ICS scholars against "*camping in an attitude of pure criticism"*. They recognized that what distinguishes "*communicational objects is that they have at the same time a social, technical and semiotic dimension*[xxxii]". Perriault (2004) and Staii (2004) have also exhorted ICS scholars to become involved in discussions on how to design systems that will better serve the society instead of being only in a "*let's-wait-and-critique*» posture because technological solutions will be built anyway without input from the field.

Earlier on, Polity (1999) observed that owing to its history, information science has been astride three types of platforms: fundamental research, professional practices and the information industry. It is in the interaction between these three branches that the discipline will nourish its research agenda, fuel its fundamental research by observing information processes and usage in real life situations, and design informa-

tion systems that can meet societal needs. To borrow the tree metaphor, denying one component is like cutting off a main branch of the tree, which while withering and dying, may well kill the whole tree.

In the different tributes written on Suzanne Briet, her visionary image of what a document is has been justly lauded as the precursor of information science but what about her enthusiasm for technology? Briet was a staunch advocate of the role of technology in documentation and information science and of competitive intelligence even if she never used these two terms (Blanquet 2007). She saw technology as an indispensable auxiliary that information professionals must master if they are to remain efficient in an ever-changing landscape. She was quite taken with the technological inventions of her time (e.g. microforms) and marveled at the "progress" these had enabled the field to accomplish in terms of storage:
"*One can transfer a whole book with its illustrations on microfilms, on microcards. A thick file (dossier), microfilmed, can be slipped into a coat Pocket. A whole Library is held withn a handbag"* (Briet 1951[xxxiii]).

Briet would certainly have been very excited by the progress accomplished by today's technology. She would for instance have enthusiastically endorsed the Internet, the web, the first e-book, the semantic web, the web of data, and the participatory web 2.0. She was visionary in predicting that "*the special librarian (documentalist) will be more and more dependent on tools, whose technicity is increasing at lightning speed. The "homo documentator" should command, all senses alert, tomorrow's robots. Machines will be worth the same thing as the servant.[xxxiv]"*

Although the last sentence is too emphatic and likely to raise skepticism and objections, the rest of Briet's predictions have come to pass. She also saw the importance of linguistic in documentation for building multilingual terminological resources for a better dissemination of documentation languages.
Currently, there seems to be a double standard with regards to technologically-oriented research in ICS. On the one hand, the discourse towards government bodies and funding agencies is very inclusive: ICS is presented as being concerned also with technical and pragmatic solutions of which the society is in need. ICS scholars then have little qualms in claiming association with IR, information processing or even data mining[xxxv]. However, when it comes to peer-recognition for promotion via the national ruling commission for the discipline, scholars who venture into technologically-oriented research do so at their own peril. There is now a tendency to consider such works as being outside the scope of ICS, as stemming from a narrow *technicist* viewpoint of information science.

From the above discussions, it appears that there is a consensus crossing geographic and cultural barriers on the dual nature of the field, i.e, that is both technical (object paradigm) and social (subject paradigm). It then follows that information science needs research on both technical and social aspects to accomplish its agenda. This dual nature of the field is a strength but also a weakness. As Bates (1999: 1049) observed: "*This is one of the reasons we have failed to coalesce as a field around one standard methodological paradigm. For one thing, we need this methodological variety to solve these problems".*
While the omnipresence of technology in the society should not lead to adopting a purely "*technicist"* approach to scientific problems nor to a "*techno-euphoria"*, it should not on the other hand lead to the denial of the necessity to employ technology to address information problems. Technology has played a major role in bringing to fruition many of the information science research agenda (design of information systems, OPACs, digital libraries, search engines, knowledge databases, man-machine interface, user studies, knowledge organization artefacts). Robertson (2008) went as far as saying that research in the IR field is the best claim that information science can make to "scientificity" while at the same time acknowledging that IR research lacked theory.

The "attraction – repulsion" swing between technology and human-focused research, between anchoring information science on the "hard[xxxvi]" sciences or on the humanities and social sciences is not unique to the French context. Marcia Bates (2005) explained how the current mood swing in the Anglophone world has also shifted towards the social, subjectivist and hermeneutic conception of information and of information science whereas 50 years before, humanities fields sought methods from the "hard sciences" in order to be accepted as scientific fields:

"*In more recent years, there has been a reaction to this approach [extreme scientism and logical positivism], with a concomitant swing towards the use of what are essentially humanities methods in the social sciences. Now the fashion is to deride the very scientific techniques so recently valorized and to insist that only highly qualitative and subjectivist methods produce credible results. Hermeneutic interpretation, detailed participant observation and historical analysis, among others, are now the methods of choice. Nowadays, it is seldom remembered, however, that the logical positivist approach was itself a reaction to what were deemed ineffective subjectivist*

research philosophies that preceded it. […] *In like fashion, attitudes toward information itself have swung between highly objectivist and subjectivist interpretations.*» Bates (2005).

Buckland (2009) equally observed that the British Institute of Information Scientists (IIS), under the aegis of Jason Farradane, also sought to identify with hard sciences (notably Physics) in the early years of its existence before finally embracing a more social turn much later.
Hence, the ambivalent attitude French ICS scholars show towards the sciences, especially Artificial Intelligence and computer science appears to be a universal trait: we invoke technology and the "hard sciences" when they serve our purposes, we decry them when they do not.

Whither Information Science in France?

A consequence of the disconnect in the research carried out by contemporary French information scientists and those done by the pioneering figures is that 21st century is that French information science scientists are barely visible on the international scene. The most well known ones are historic figures like Suzanne Briet, Eric le Grolier, Robert Pagès, Jean Claude Gardin, Gérard Cordonner, and a few 20th century authors like Jacques Maniez, Sylvie Fayet-Scribe or Yves Le Coadic, most of whom have now retired.

The cohabitation of information science with communication science in the same (inter-)discipline brings its own trials that render the quest for identity and visibility more difficult in the French higher education context. Communication science departments far outnumber information science ones and therefore wield a better negotiating power in defining the (inter-)discipline's center of gravity. An alarmist view would be to say that very existence of information science in France is in the balance. The current shift in power is in favor of social and theoretical research agenda. One consequence as already mentioned is that research of any technological orientation is seen as falling outside the scope of ICS even when the actual modeling and programming are done by computer scientists. Signs of this trend are somewhat visible in the make up of consortiums formed for funded projects proposals, where communication science teams are partnering directly with computer science teams who are in charge of the more hard-grounded algorithmic and technological work. Meanwhile, many observers acknowledge that humans nowadays cannot carry out their tasks adequately without resorting to technological tools. It is also clear to me that if Information science abandons the task of systems design solely to computer scientists, then it can have no way of influencing the design choices to better meet societal needs. Information science and documentation have traditionally been concerned with knowledge organization systems - not only in the technological sense but also in the conceptual and methodological dimensions, by designing theoretical systems based on certain epistemological assumptions – the end goal being to enhance access to information. It will be a pity if information science in France is forced to abandon this traditional heritage to computer scientists who are even less aware of the historical, theoretical and social underpinnings to such an enterprise.

To end on a more optimistic note, one can conjecture that a possible way for the future lies in a mutual understanding of information science research agenda by communication science scholars and *vice versa*. In the French higher academic system, one branch cannot survive without the other. Therefore, in order to gain sufficient negotiating power as a discipline, ICS needs to be united. There is also hope that the younger generation of communication science scholars who are by virtue of age more accepting of the bigger role technology is set to play even in scientific inquiry (e-science and cyber-infrastructure initiatives are springing up virtually in most developed countries), they would be in a better position to understand information science agenda. They are also in a better position to perceive more easily the potential interest of combining theoretical with applied research into different aspects of computer-mediated communication (social networks, virtual identity, transformation of professional work practices, influence of technology on scientific research...). This could foster a real meshing of information and communication sciences and pave the way to them regaining a more visible place on the international arena.

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[i] http://en.wikipedia.org/wiki/Habilitation

[ii] This short biography is based on the one written by Palermiti (2000), available online at http://www.iut2.upmf-grenoble.fr/RI3/Mise_jour_06/TPS_precurseurs.htm.

[iii] Centre National de Recherche Scientifique.

[iv] Union Française des Organismes Documentaires.

[v] Ecole des Hautes Etudes en Sciences Sociales

[vi] Original unpublished text available at http://www.iut2.upmf-grenoble.fr/RI3/Mise_jour_06/TPS_precurseurs.htm

[vii] The original sin, in reference to the biblical story of Adam and Eve eating the forbidden fruit in the garden of Eden. The analogy here is that ICS was flawed from birth.

[viii] Jean Meyriat regrettably passed away on 26th december 2010. He was aged 89.

[ix] In french "Sciences de l'information et de la communication" (SIC).

[x] In french, "Société Française des sciences de l'information et de la communication" (SFSIC).

[xi] INstitut de l'Information Scientifique et Technique du CNRS.

[xii] This is because the CNRS has a department called "*Sciences et Techniques de l'Information et Communication*" (STIC) which is often confused with the ICS field as both have the "IC" in common (information and communication). Indeed, the CNRS has funded some interdisciplinary research in this STIC programme involving information science scholars.

[xiii] The french title is "Information et Communication : théorie générale".

[xiv] My translation of "*l'étude des processus d'information ou de communication relevant d'actions organisées, finalisées, prenant ou non appui sur des techniques, et participant des médiations sociales et culturelle*."

[xv] Jeanneret Y, Ollivier B. (eds.) Hermès, special issue on *Les sciences de l'information et de la communication*." Hermès, vol 38, 2004. Online at http://documents.irevues.inist.fr/handle/2042/9030.

[xvi] My translation of the author's original text: «*Les disciplines ont plus ou moins un objet. Entendons par là que celui-ci se définit plus ou moins aisément et que, même pour les plus assurés, il n'est jamais certain qu'il ne se dérobe pas. Dans la mesure où la démographie traite des variations de population, elle a un objet saisissable, comme la gastroentérologie ou l'astrophysique (au moins pour le non spécialiste). L'objet de la sociologie est déjà moins facile à circonscrire. Il peut être partout. Celui de la linguistique ne l'est pas du tout pour le non linguiste, puisqu'il repose sur une catégorie produite par les linguistes qui ont inventé deux catégories, langue et parole, et décidé de traiter de ce que recouvre pour eux la première. Quant à la philosophie, son objet est le plus in(dé)fini.*" (Jeanneret Y, Ollivier B., 2004, p. 14).

[xvii] In the original text : "*Il fallait aussi refuser d'entrée un certain nombre de complexes et de représentations qui ont animé longtemps des débats sur la scientificité des Sciences de l'information et de la communication. Repousser, autant que possible, l'idée que les objets, les problèmes et les méthodes seraient propriétés des disciplines particulières*."

[xviii] My translation of " *Le désir de délimiter en principe le champ d'une discipline se heurte en effet à deux apories classiques concernant les critères de reconnaissance et de validité d'une science.*

- Au plan socio-historique, le cercle du relativisme : une discipline est ce que les chercheurs qui l'animent décident qu'elle est. Son identité repose donc plus sur l'accord entre la communauté des chercheurs que sur des attendus conceptuels, et dépend avant tout de l'état des rapports de force entre eux.

- Au plan théorique, le cercle de la connaissance : tout jugement sur la pertinence ou la validité d'un énoncé repose lui-même sur la reconnaissance implicite d'un certain paradigme donc sur un autre jugement lui-même indémontrable. Dès lors il n'y a pas et il ne peut pas y avoir de définition scientifique de la scientificité ni de "théorie d'une bonne théorie." (Perret 2004, p. 122)

[xix] My translation of "*Avoir une approche communicationnelle d'un phénomène c'est l'analyser comme élément d'un système contribuant, dans un mouvement circulaire, à l'émergence d'un autre phénomène*." (Mucchielli, 2000: 43)

[xx] My translation of "*Selon cette approche, tout mot est pensé dans une théorie ou en référence à un modèle plus ou moins explicite. Il a dès lors des propriétés particulières. Parler "communication", c'est, pour être compris, indiquer d'abord la théorie de la communication dans laquelle on se situe [2, p. 28-33]. Il en est de même pour "information". Un spécialiste ne peut en parler sans faire référence à une théorie sous-jacente. À tout le moins, il doit systématiquement utiliser "information" avec un qualificatif ou un explicatif afin de se faire comprendre des autres spécialités. Selon cette approche, tout mot est pensé dans une théorie ou en référence à un modèle plus ou moins explicite. Il a dès lors des propriétés particulières. Parler "communication", c'est, pour être compris, indiquer d'abord la théorie de la communication dans laquelle on se situe [2, p. 28-33]. Il en est de même pour "information". Un spécialiste ne peut en parler sans faire référence à une théorie sous-jacente. À tout le moins, il doit systématiquement utiliser "information" avec un qualificatif ou un explicatif afin de se faire comprendre des autres spécialistes."* Fondin H, La Science de l'information : posture épistémologique et spécificité disciplinaire, *Documentaliste - Sciences de l'information,* 2001, vol. 38, n° 2, p. 120.

[xxi] In the original text: "*L'information est-elle un objet réel, objectivable, ou un objet social ? À travers cette interrogation est posée toute la question du "sens" et de son attribution. Le sens, cette représentation mentale cohérente que tout homme construit ou dégage de quelque chose observée dans son environnement, ce qu'il appelle information si ce sens est partagé, est-il immanent car déposé dans le document par son auteur, ou construit car élaboré contextuellement par les acteurs, ici par celui qui lit ? Dans le premier cas, et c'est explicitement ou implicitement, ce qui est défendu par les tenants du traitement automatique de l'information, ceux qui se situent dans la vision nord-américaine de la SI, l'information est un élément discret. Pour eux, toutes opérations d'extraction d'éléments par repérage de formes linguistiques ou autres sur les textes est dès lors possible. Et du fait qu'on travaille sur le document original, les résultats des opérations de traitement ne sont que plus fidèles et au texte et à son auteur.*" (Fondin 2005).

[xxii] In the original text: "*Dans le second cas, et c'est une contestation forte de toute idée de sens immanent, et donc de la validité de tout traitement entièrement automatique, et donc de la SI "historique", seul l'homme, ici le lecteur, en situation vécue, crée du sens. Et le sens est obligatoirement lié à un contexte, celui de la réception. L'information, autrement dit le contenu d'un document, ne peut donc pas*

être quelque chose de figé, définitif, éternel. Certes cela n'autorise pas pour autant chaque lecteur à lire n'importe quoi, mais cela redonne toute sa place à celui-ci. À chaque lecteur de construire, à travers le sens qu'il attribue, un espace social de partage de sens. Dans cette optique, l'objet de la SI ne peut, ne doit pas être un objet physique. C'est un objet éminemment social, avec des acteurs, des enjeux, des contextes..." Fondin's (2005).

[xxiii] In the original text: "*Finalement, ce ne sont donc pas les données elles-mêmes qui supportent l'information, mais les liens aux interstices entre les données, sur lesquels viennent se constituer les schèmes structurants*." Leleu-Merviel (2010 : 12).

[xxiv] In the original text: "*Ainsi, la spécificité de la science de l'information est d'étudier les modalités mêmes – le processus – de cette communication finalisée. Cette étude est inspirée par le souci d'une approche globale, que ce soit autour d'un dispositif ou d'un système social. Ce souci doit être celui de la SI car aucune autre discipline n'a globalement ce projet*."

[xxv] In the original text: *"le terme "science" est inadéquat pour qualifier ce secteur aux projets très techniques. On entretient la confusion entre science et technique ou ingénierie*." (Fondin 2005).

[xxvi] My translation of "*Aucun chercheur nord-américain n'imagine avoir quelque chose en commun avec des chercheurs en communication. La SI [anglosaxonne, historique selon lui] se veut une science à part entière, revendiquant ce statut. Le seul et énorme problème, c'est que, quelque quarante ans après sa naissance, la SI court encore après cette reconnaissance. En effet comment envisager une étude de l'information en excluant de prendre en compte les phénomènes de communication qui l'accompagnent ? Comment étudier le contenu d'un message sans considérer ceux qui les créent, ceux qui les transforment, ceux qui les utilisent... ? Ces activités, qui sont d'une grande complexité du fait des enjeux qu'elles traduisent, sont des activités communicationnelles. Dans cette logique, la SI ne peut pas ne pas appartenir aux SIC. C'est d'ailleurs ce refus qui fait que la SI "historique" s'enferme dans une vision technique, qui paraît sans avenir, autour des modalités de la production, de la diffusion et de l'utilisation, en occultant trop tous les facteurs humains sous-jacents à ces activités.*", Fondin (2005).

[xxvii] "*More specifically, information science is a field of professional practice and scientific inquiry addressing the problem of effective communication of knowledge records— "literature"—among humans in the context of social, organizational, and individual need for and use of information*", Saracevic (1999: 1055).

[xxviii] My translation of "*Les sciences de l'information s'appuient sur les racines solides des professions traditionnelles du document : la bibliothéconomie et l'archivistique, et se déploient dans les avenues plus récentes de l'information* stratégique, la gestion des connaissances et les multiples développements induits par les technologies numériques." Accessible at http://www.ebsi.umontreal.ca/ (Visited on 26.12.2009).

[xxix] http://fr.wikipedia.org/wiki/Sciences_de_l'information_et_des_bibliothèques

[xxx] In the original text: "*En revanche, si la SI, science comme les autres, se définit par son objet et par ce qu'elle cherche à expliquer ou à comprendre dans l'objet qu'elle étudie, et par les savoirs et méthodes convoqués, l'approche interdisciplinaire se justifie pleinement en ce que chaque chercheur peut utiliser, en cohérence, des éléments pertinents empruntés à d'autres sciences en les reconstruisant par rapport à son objet. La spécificité doit donc d'abord être celle de l'objet d'étude, ce qui, en outre, permettrait d'afficher devant les autres une réelle identité. Reste à définir cet objet spécifique. "* (Fondin 2005).

[xxxi] In the original text : *"...il reste maintenant à redécouvrir que la communication est avant tout une question* ***technique*** *et, souvent, avec les moyens du bord*". Baltz, 2007:19.

[xxxii] In the original text : "*Mais le propre des objets communicationnels est qu'ils ont à la fois une dimension sociale, une dimension technique et une dimension sémiotique"*. Jeanneret et Ollivier, 2004, *ibid*, p. 88.

[xxxiii] "*On transfère un ouvrage entier, avec ses illustrations sur des microfilms, sur des microfiches, sur des "microcards". Un épais dossier se glisse, microfilmé, dans une poche de veston. Une bibliothèque entière est renfermée dans un sac à main.*" (Briet 1951).

[xxxiv] In the original text : "*le documentaliste sera de plus en plus tributaire d'un outillage, dont la technicité augmente à une vitesse grand V. "L'homo documentator" doit se préparer à commander, toutes facultés en éveil, aux robots de demain. La machine vaudra ce que vaut le servant*". (Briet 1951).

[xxxv] In a letter dated 22 february 2010 adressed to a Council for the development of Humanities and Social Sciences by the president of the French Association for Information and Communication Sciences (SFSIC), requesting for the inclusion of ICS in the list of humanities disciplines, lists the areas of expertise of the field: "*Elles ont une expertise traditionnelle sur la veille, le traitement, la sélection et la qualification de l'information dont l'extrême abondance nécessite le développement de recherches dans des domaines aussi pointus que le «data mining», la veille stratégique, ou encore les technologies de surveillance et de protection de la vie privée."*

[xxxvi] I am using the term "hard sciences" here for commodity, to avoid a lengthy debate, and also to portray a common if not unfounded belief that some sciences are "hard" whereas others are "soft". My personal conviction is that such boundaries cannot be established convincingly.

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Endnotes